

# **Flash Worksheets**

## **Back and Upper Limb**

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**WHAT SHOULD YOU KNOW?****1. UNDERSTAND HOW MUSCLES ARE GROUPED BY COMPARTMENT, BY FUNCTION, AND BY NERVE SUPPLY.****a. Back**

- i. Extrinsic back muscles
- ii. Intrinsic back muscle

**b. Upper Limb**

- i. Extrinsic shoulder muscles
- ii. Intrinsic shoulder muscles
- iii. Anterior (flexor) arm muscles
- iv. Posterior (flexor) arm muscles
- v. Anterior forearm (flexor-pronator) muscles
- vi. Posterior forearm (extensor-supinator) muscles
- vii. Intrinsic hand muscles

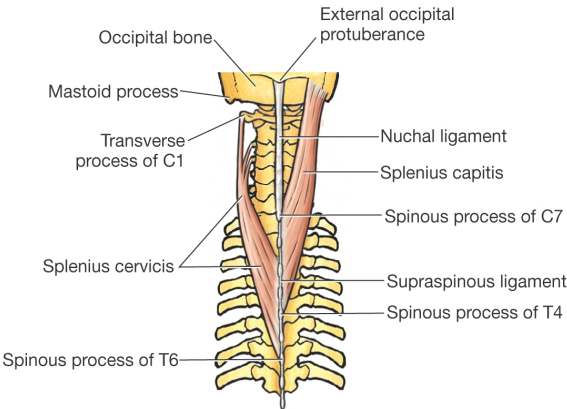
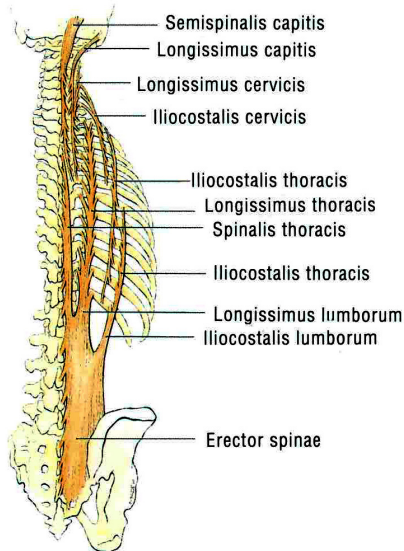
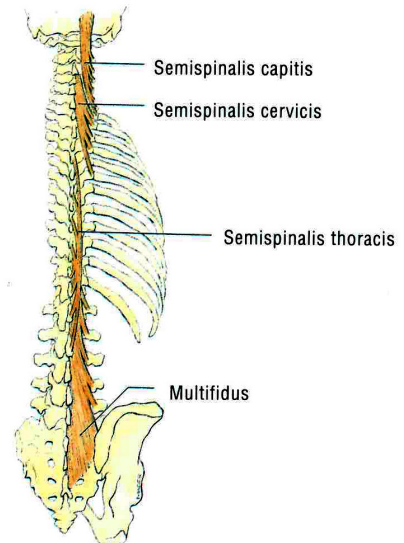
**2. FOR INDIVIDUAL MUSCLES****a. Identify the origin(s), also called proximal attachments, and insertion(s), also called distal attachments.**

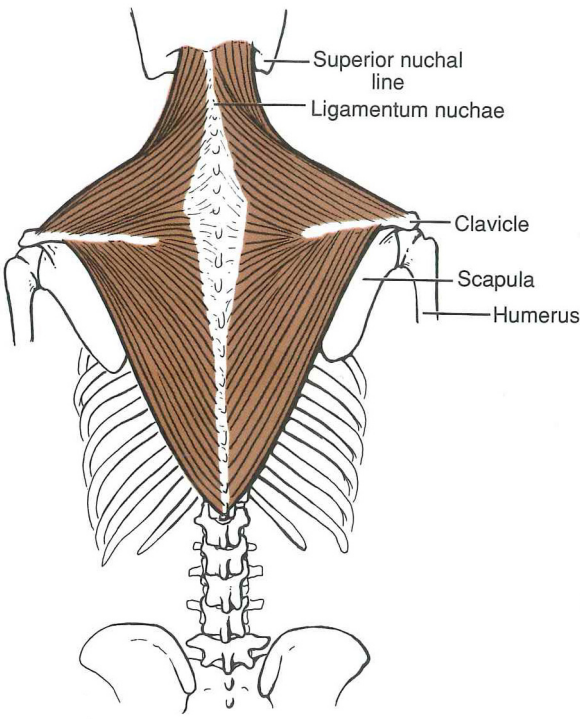
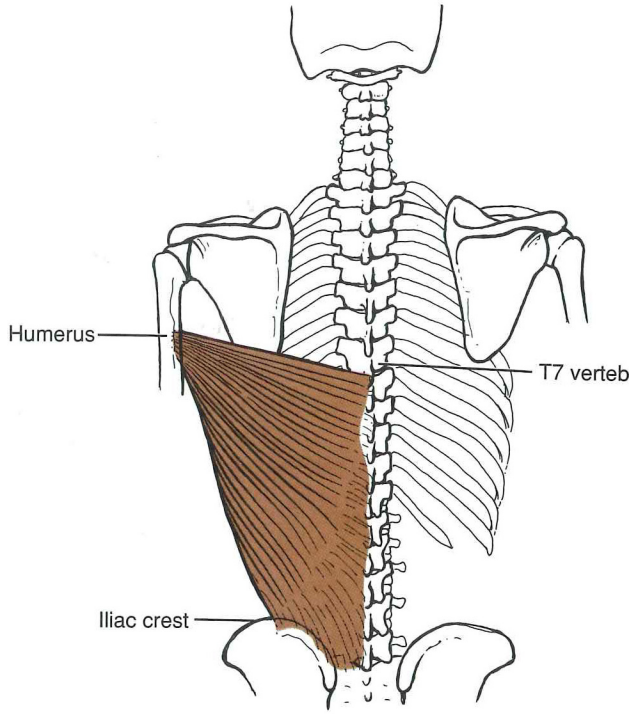
*Note: this information is NOT provided in these sheets, but you can – and should – find it in your textbook.*

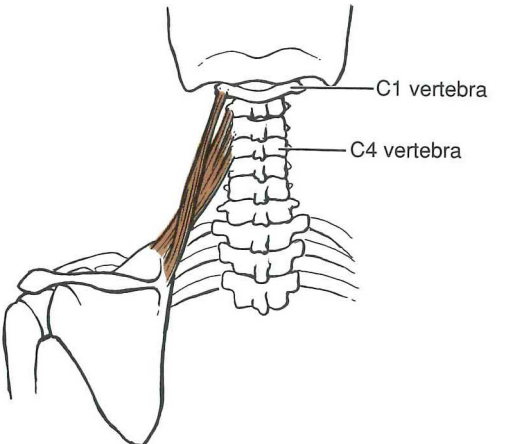
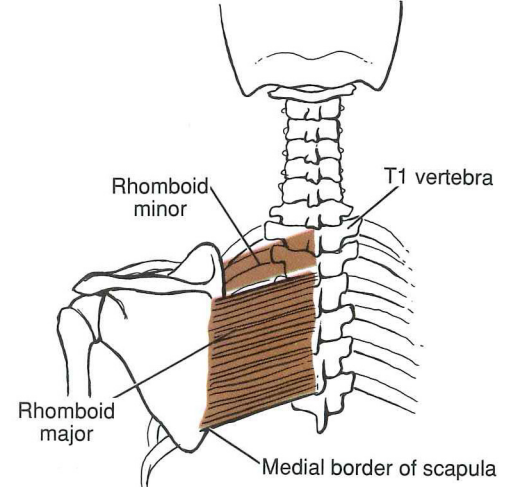
**b. Give the nerve supply, including its name, spinal cord contributions (e.g., C5-T1), and pathway through the brachial plexus (e.g., upper vs. lower).****c. Describe the main action(s).****3. HAVE A BASIC UNDERSTANDING OF THE DEFICITS THAT WOULD RESULT FROM DAMAGE TO A SPECIFIC NERVE, AND THE PARALYSIS OF A MUSCLE GROUP OR INDIVIDUAL MUSCLE.**

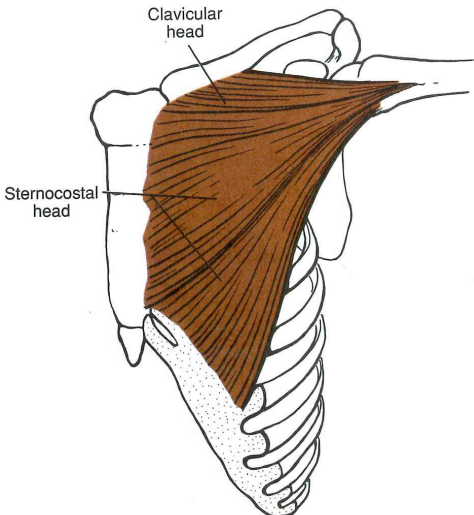
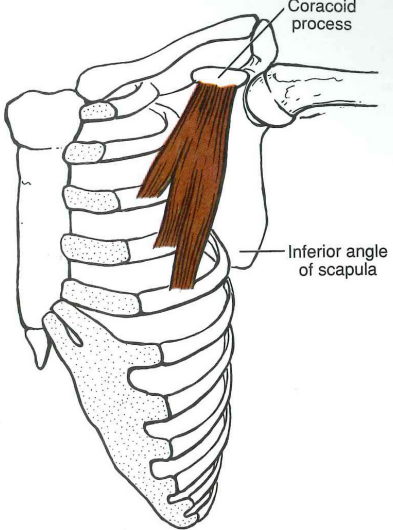
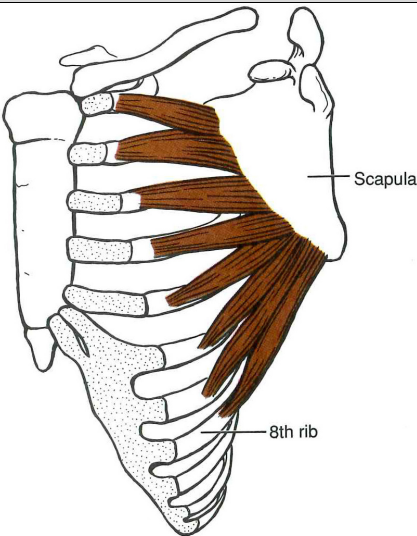
**Why are these called Flash Worksheets?** Because the muscles are grouped on a page, rather than individually, I decided to call these Flash Worksheets (as opposed to Flash Cards).

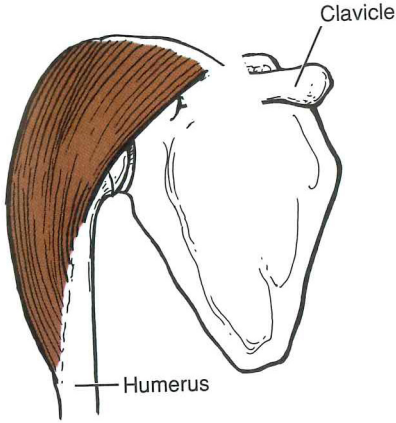
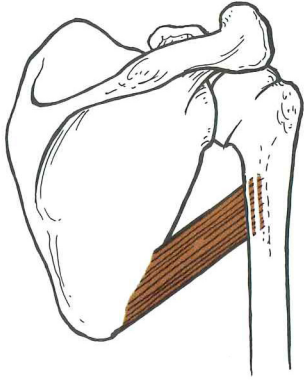
**Source:** Most images are from Clinical Oriented Anatomy, 3<sup>rd</sup> edition (1992) by Keith Moore (they are not in the current 6<sup>th</sup> edition, which is the required text for this course)/

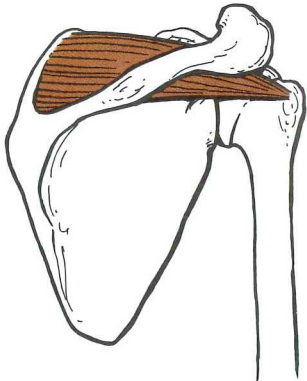
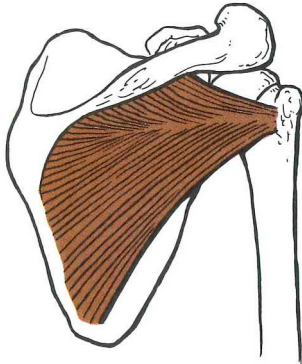
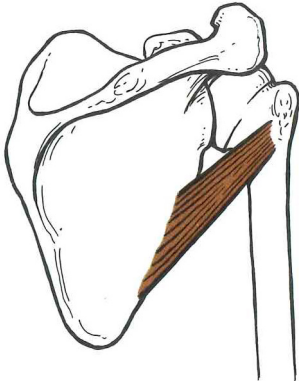
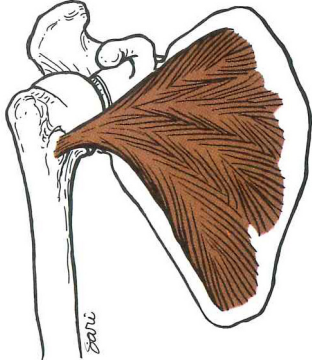
Intrinsic back muscles (superficial)		Splenius cervicis & capitis
	Dorsal rami branches	<p><u>Unilateral</u></p> <ul style="list-style-type: none"> <li>• Laterally flex neck</li> <li>• Rotate to ipsilateral (same) side</li> </ul> <p><u>Bilateral</u></p> <ul style="list-style-type: none"> <li>• Extend head &amp; neck</li> </ul>
Intrinsic back muscles (intermediate)		Erector spinae
	Dorsal rami branches	<p>Iliocostalis Longissimus Spinalis</p> <p><u>Unilateral</u></p> <ul style="list-style-type: none"> <li>• Laterally flex vertebral column</li> </ul> <p><u>Bilateral</u></p> <ul style="list-style-type: none"> <li>• Extend vertebral column</li> <li>• <i>Control flexed vertebral column</i></li> </ul>
Intrinsic back muscles (deep)		Transversospinal muscles
	Dorsal rami branches	<p>Semispinalis Multifidus Rotatores</p> <p><u>Unilateral</u></p> <ul style="list-style-type: none"> <li>• Rotates to contralateral (opposite) side</li> </ul> <p><u>Bilateral</u></p> <ul style="list-style-type: none"> <li>• Extend head &amp; vertebral column</li> </ul>

Extrinsic shoulder muscle (posterior)		Trapezius
	<p>Accessory n. (CN XI) Cervical nn. (C3-C4)</p> <p>C3-C4 (proprioception)</p> <p><u>Proprioception</u> provides information about:</p> <ul style="list-style-type: none"> <li>• Positions of body parts</li> <li>• Shape, size, weight of objects held in the hand</li> <li>• Range and direction of movement</li> </ul>	<p><u>Superior part</u> Elevates scapula</p> <p><u>Middle part</u> Retracts scapula</p> <p><u>Inferior part</u> Depresses scapula</p>
Extrinsic shoulder muscle (posterior)		Latissimus dorsi
	<p>Thoracodorsal n. (C6-C8)</p>	<p>Extends, adducts, &amp; medially rotates humerus</p>

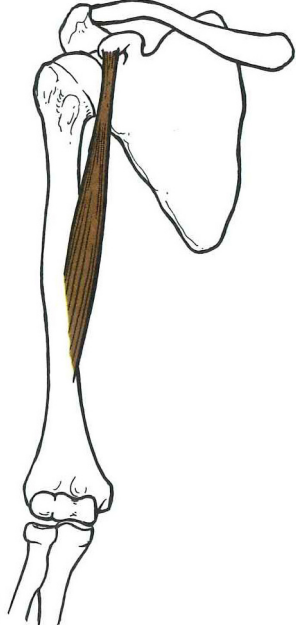
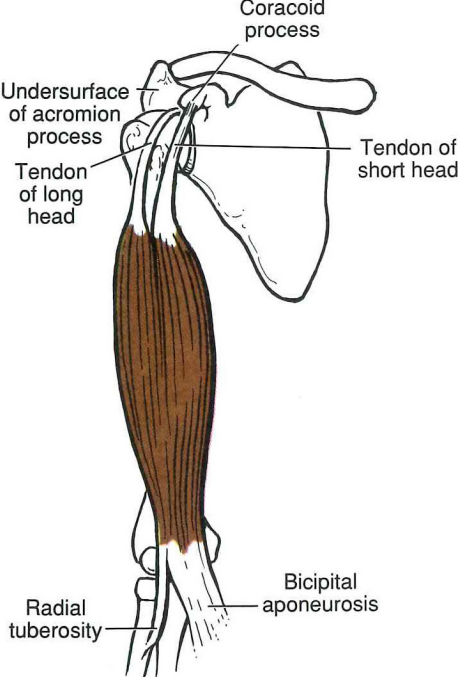
Extrinsic shoulder muscle (posterior)	Levator scapulae	
	<p>Dorsal scapular n. (C5) Cervical nn. (C3-C4)</p>	<ul style="list-style-type: none"> <li>• Elevates scapula</li> <li>• Rotates scapula to direct glenoid cavity inferiorly</li> </ul>
Extrinsic shoulder muscle (posterior)	Rhomboid major & minor	
	<p>Dorsal scapular n. (C4-C5) Cervical nn. (C3-C4)</p>	<ul style="list-style-type: none"> <li>• Retracts scapula</li> <li>• Rotates scapula to direct glenoid cavity inferiorly</li> </ul>

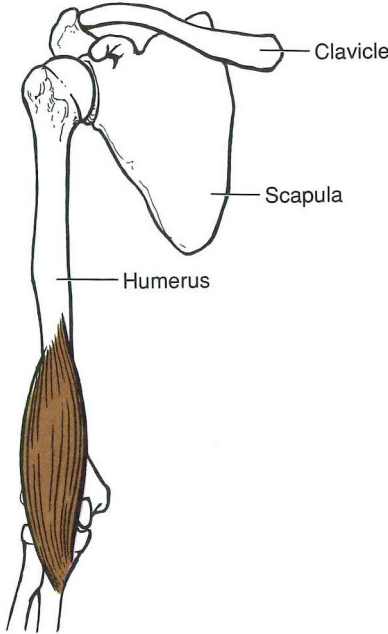
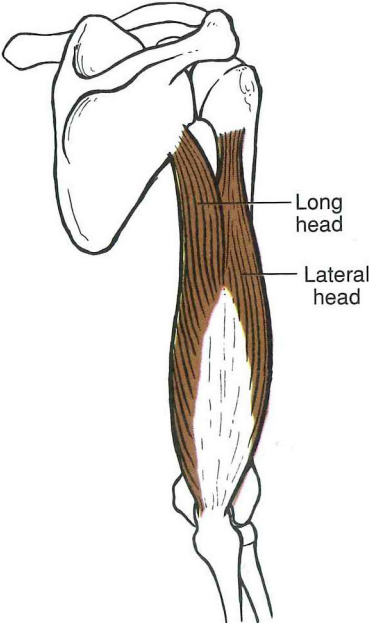
Extrinsic shoulder muscle (anterior)		Pectoralis major
	<p>Lateral &amp; medial pectoral nn.</p> <p><u>Clavicular head</u>: C5-C6</p> <p><u>Sternocostal head</u>: C6-T1</p>	<p><u>Both heads working together</u></p> <ul style="list-style-type: none"> <li>• Adducts &amp; medially rotates humerus</li> </ul> <p><u>Clavicular head</u></p> <ul style="list-style-type: none"> <li>• Flexes humerus</li> </ul> <p><u>Sternocostal head</u></p> <ul style="list-style-type: none"> <li>• Extends humerus (from flexed position)</li> </ul>
Extrinsic shoulder muscle (anterior)		Pectoralis minor
	<p>Medial pectoral n. (C8-T1)</p> <p>Some innervation from lateral pectoral n.</p>	<p>Stabilizes scapula (draws it inferiorly &amp; anteriorly against thoracic wall)</p>
Extrinsic shoulder muscle (anterior)		Serratus anterior
	<p>Long thoracic n. (C5-C7)</p>	<ul style="list-style-type: none"> <li>• Protracts scapula</li> <li>• Rotates scapula to direct glenoid cavity superiorly</li> <li>• Holds scapula against thoracic wall</li> </ul>

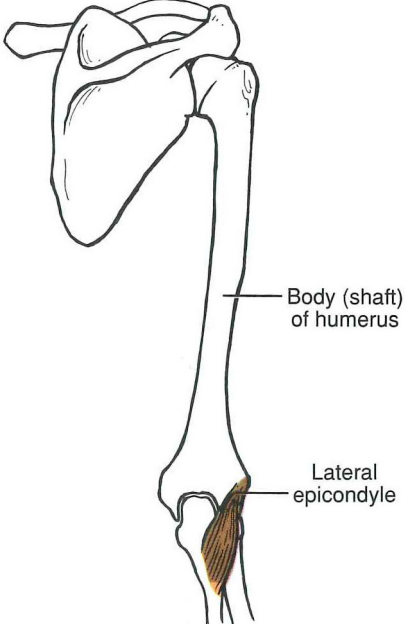
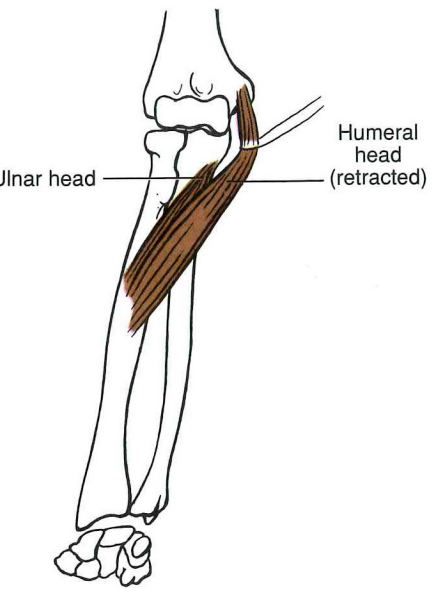
Intrinsic shoulder muscle		Deltoid
	<p>Axillary n. (C5-C6)</p>	<p><u>Clavicular (anterior) part</u></p> <ul style="list-style-type: none"> <li>• Flexes &amp; medially rotates arm</li> </ul> <p><u>Acromial (middle) part</u></p> <ul style="list-style-type: none"> <li>• Abducts arm</li> </ul> <p><u>Spinal (posterior) part</u></p> <ul style="list-style-type: none"> <li>• Extends &amp; laterally rotates arm</li> </ul>
Intrinsic shoulder muscle		Teres major
	<p>Lower subscapular n. (C5-C6)</p>	<p>Adducts &amp; medially rotates arm</p>

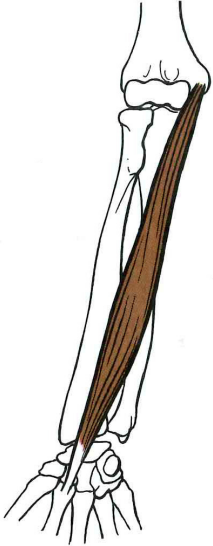
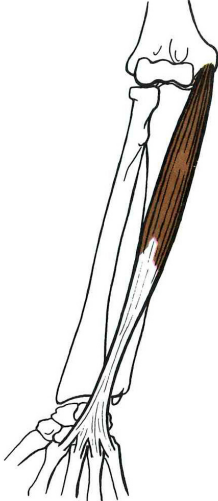
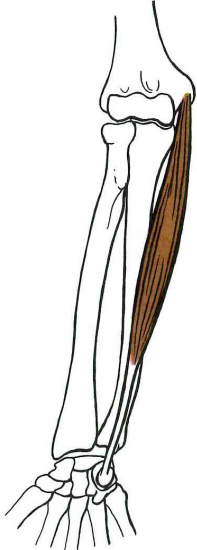
Intrinsic shoulder muscle (rotator cuff muscle)		Supraspinatus
	Suprascapular n. (C4-C6)	<ul style="list-style-type: none"> <li>Initiates abduction of arm</li> <li>Assists deltoid in abduction of arm</li> </ul> <p><u>As a rotator cuff muscle:</u> helps hold head of humerus in glenoid cavity</p>
Intrinsic shoulder muscle (rotator cuff muscle)		Infraspinatus
	Suprascapular n. (C5-C6)	<p>Laterally rotates arm</p> <p><u>As a rotator cuff muscle:</u> helps hold head of humerus in glenoid cavity</p>
Intrinsic shoulder muscle (rotator cuff muscle)		Teres minor
	Axillary n. (C5-C6)	<p>Laterally rotates arm</p> <p><u>As a rotator cuff muscle:</u> helps hold head of humerus in glenoid cavity</p>
Intrinsic shoulder muscle (rotator cuff muscle)		Subscapularis
	Upper & lower subscapular nn. (C5-C7)	<p>Medially rotates &amp; adducts arm</p> <p><u>As a rotator cuff muscle:</u> helps hold head of humerus in glenoid cavity</p>

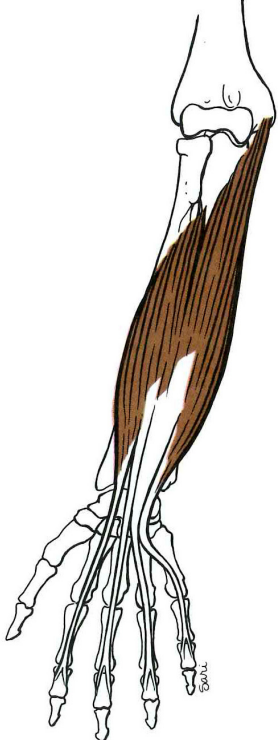
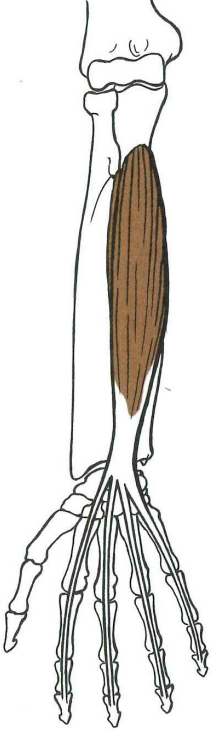


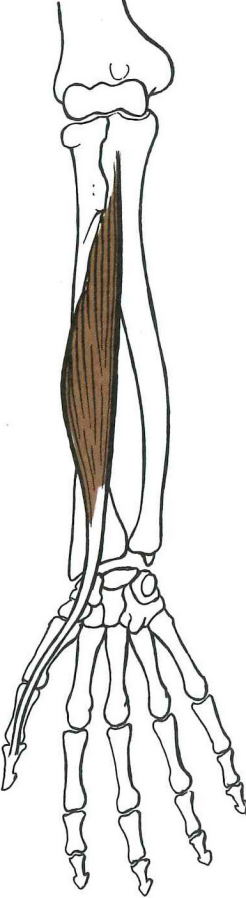
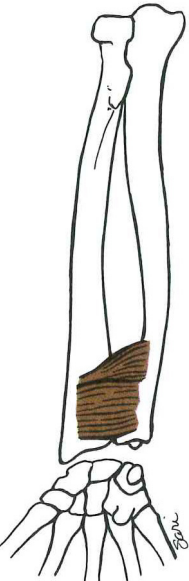
Anterior (flexor) arm muscle		Coracobrachialis
	<p>Musculocutaneous n. (C5-C7)</p>	<ul style="list-style-type: none"> <li>• Helps flex &amp; adduct arm</li> <li>• Resists shoulder dislocation</li> </ul>
Anterior (flexor) arm muscle		Biceps brachii
	<p>Musculocutaneous n. (C5-C6)</p>	<p><u>Entire muscle</u></p> <ul style="list-style-type: none"> <li>• Supinates forearm</li> <li>• With forearm supinated, it flexes forearm</li> </ul> <p><u>Short head</u></p> <ul style="list-style-type: none"> <li>• Resists shoulder dislocation</li> </ul>

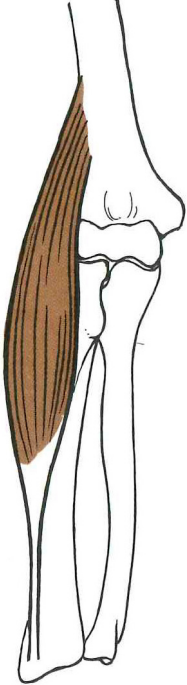
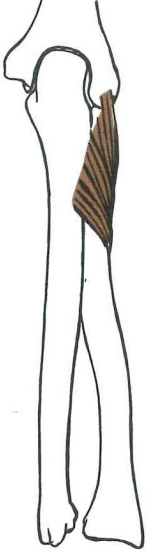
Anterior (flexor) arm muscle		Brachialis
 <p>Clavicle</p> <p>Scapula</p> <p>Humerus</p>	<p>Musculocutaneous n. (C5-C6)</p> <p><u>Lateral part</u> Radial n.</p>	<p>Flexes forearm</p>
Posterior (extensor) arm muscle		Triceps brachii
 <p>Long head</p> <p>Lateral head</p>	<p>Radial n. (C6-C8)</p>	<p><u>Entire muscle</u></p> <ul style="list-style-type: none"> <li>• Extends forearm</li> </ul> <p><u>Long head</u></p> <ul style="list-style-type: none"> <li>• Extends arm</li> <li>• Resists shoulder dislocation</li> </ul>

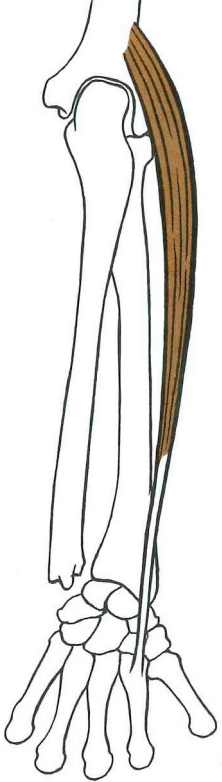
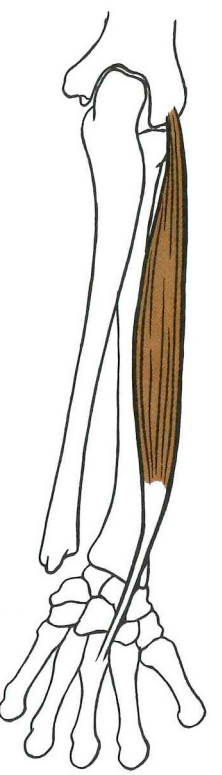
Posterior (extensor) arm muscle		Anconeus
 <p>Body (shaft) of humerus</p> <p>Lateral epicondyle</p>	Radial n. (C7-T1)	<ul style="list-style-type: none"> <li>• Assists triceps in forearm extension</li> <li>• Stabilizes elbow joint</li> </ul>
Anterior (flexor-pronator) forearm muscle		Pronator quadratus
 <p>Ulnar head</p> <p>Humeral head (retracted)</p>	Median n. (C6-C7)	Pronates & flexes forearm

<b>Anterior (flexor-pronator) forearm muscle</b>		<b>Flexor carpi radialis</b>
	Median n. (C6-C7)	Flexes & abducts hand (at wrist)
<b>Anterior (flexor-pronator) forearm muscle</b>		<b>Palmaris longus</b>
	Median n. (C7-C8)	Flexes hand (at wrist) Tenses palmar aponeurosis
<b>Anterior (flexor-pronator) forearm muscle</b>		<b>Flexor carpi ulnaris</b>
	Ulnar n. (C7-C8)	Flexes & adducts hand (at wrist)

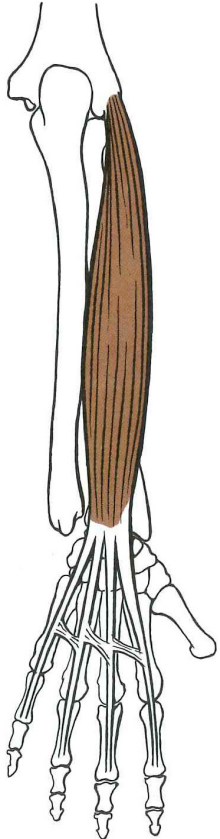
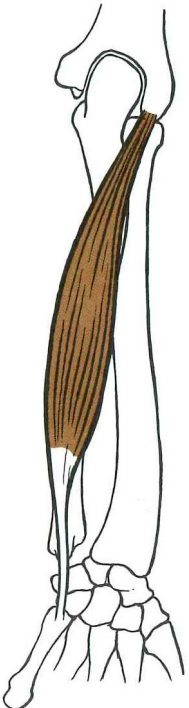
Anterior (flexor-pronator) forearm muscle		Flexor digitorum superficialis
	Median n. (C7-T1)	<ul style="list-style-type: none"> <li>• Flexes hand (at wrist)</li> <li>• Flexes MP joints</li> <li>• Flexes PIP joints</li> </ul>
Anterior (flexor-pronator) forearm muscle		Flexor digitorum profundus
	Median n. (C8-T1) Ulnar n. (C8-T1)	<ul style="list-style-type: none"> <li>• Flexes hand (at wrist)</li> <li>• Flexes MP joints</li> <li>• Flexes PIP joints</li> <li>• Flexes DIP joints</li> </ul>

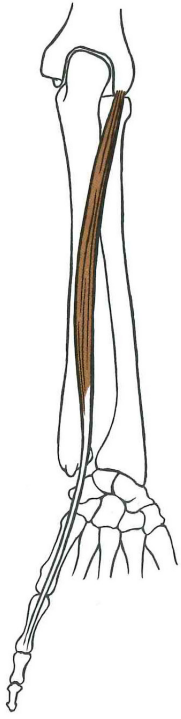
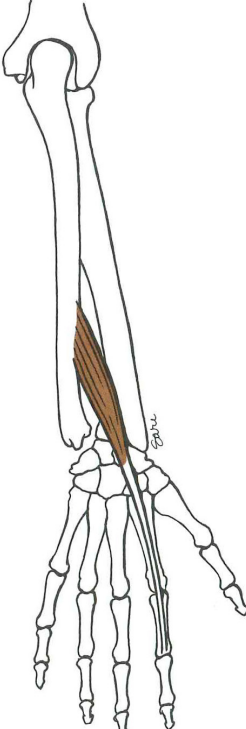
Anterior (flexor-pronator) forearm muscle		Flexor pollicis longus
	Median n. (C8-T1) – anterior interosseous n.	Flexes phalanges of thumb
Anterior (flexor-pronator) forearm muscle		Pronator quadratus
	Median n. (C8-T1) – anterior interosseous n.	Pronates forearm

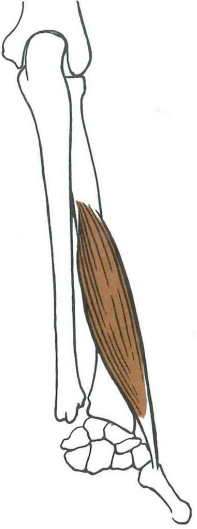
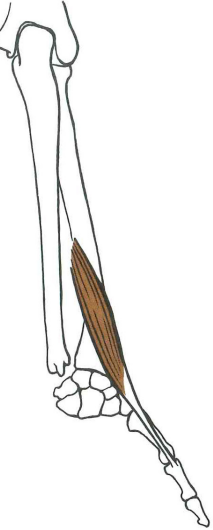
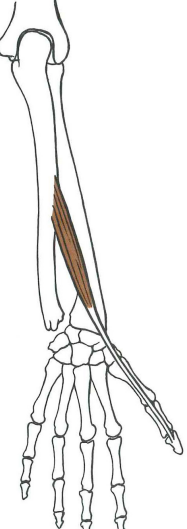
Posterior (extensor-supinator) forearm muscle		Brachioradialis
	Radial n. (C5-C7)	Flexion of forearm (weak; maximal when forearm in midpronated position)
Posterior (extensor-supinator) forearm muscle		Supinator
	Radial n. (C7, C8) – deep branch	Supinates forearm

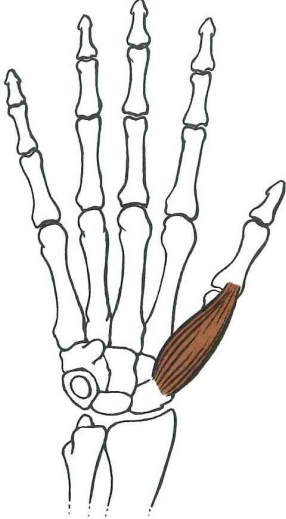
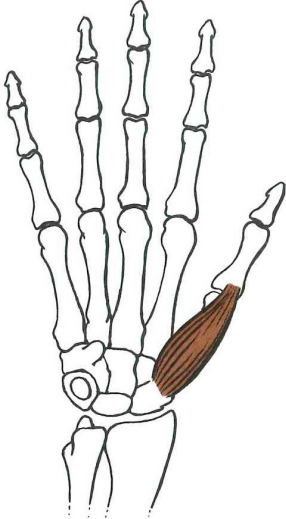
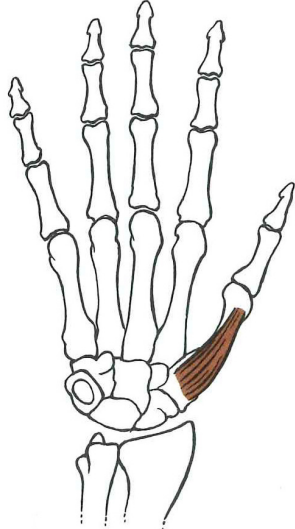
Posterior (extensor-supinator) forearm muscle		Extensor carpi radialis longus
	Radial n. (C6, C7)	Extends & abducts hand (at wrist)
Posterior (extensor-supinator) forearm muscle		Extensor carpi radialis brevis
	Radial n. (C7, C8) – deep branch	Extends & abducts hand (at wrist)

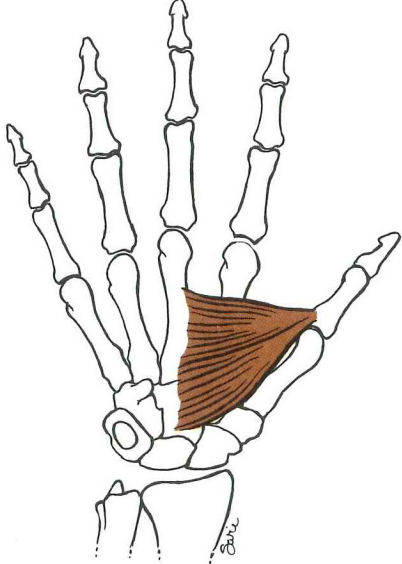


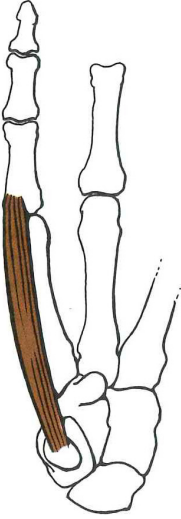
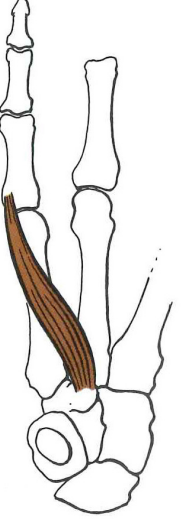
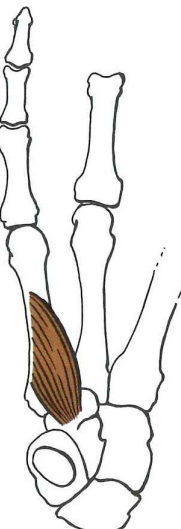
Posterior (extensor-supinator) forearm muscle		Extensor digitorum
	<p>Radial n. (C7, C8) – posterior interosseous</p>	<p>Extends hand (at wrist) Extends MP joints (digits 2-4) Extends IP joints (digits 2-4)</p>
Posterior (extensor-supinator) forearm muscle		Extensor carpi ulnaris
	<p>Radial n. (C7, C8) – posterior interosseous</p>	<p>Extends &amp; adducts hand (at wrist)</p>

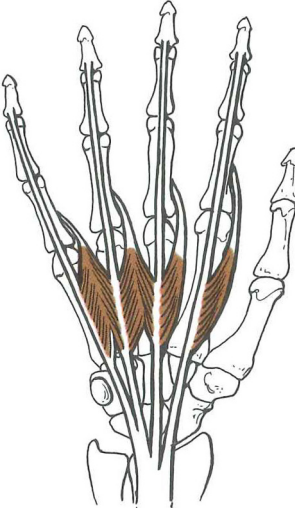
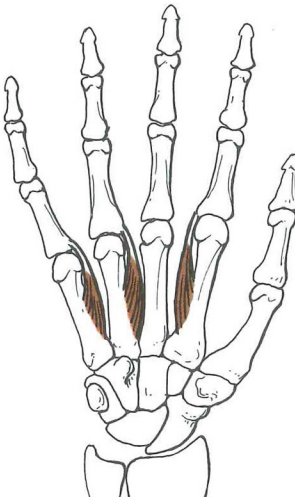
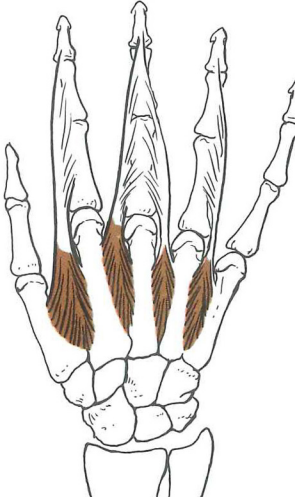
Posterior (extensor-supinator) forearm muscle		Extensor digiti minimi
	Radial n. (C7, C8) – posterior interosseous	Extends MP joint of digit 5 Extends IP joints of digit 5
Posterior (extensor-supinator) forearm muscle		Extensor indicis
	Radial n. (C7, C8) – posterior interosseous	Extends IP joints of index finger Extends MP joint of index finger Assists in extension of hand at wrist

<b>Posterior (extensor-supinator) forearm muscle</b>		<b>Abductor pollicis longus</b>
	Radial n. (C7, C8) – posterior interosseous	Abducts thumb Extends thumb at CMC joint
<b>Posterior (extensor-supinator) forearm muscle</b>		<b>Extensor pollicis brevis</b>
	Radial n. (C7, C8) – posterior interosseous	Extends thumb at MP joint Extends thumb at CMC joint
<b>Posterior (extensor-supinator) forearm muscle</b>		<b>Extensor pollicis longus</b>
	Radial n. (C7, C8) – posterior interosseous	Extends IP joint of thumb Extends MP joint of thumb Extends CMC joint of thumb

Intrinsic hand muscle – Thenar		Abductor pollicis brevis
	Median n. (C8, T1) – recurrent branch	Abducts thumb Assists in thumb opposition
Intrinsic hand muscle – Thenar		Flexor pollicis brevis
	<u>Superficial head</u> Median n. (C8, T1) – recurrent branch  <u>Deep head</u> Ulnar n. (C8, T1) – deep branch	Flexes thumb
Intrinsic hand muscle – Thenar		Opponens pollicis
	Median n. (C8, T1) – recurrent branch	Opposes thumb

Intrinsic hand muscle – Thenar		Adductor pollicis
	Ulnar n. (C8, T1) – deep branch	Adducts thumb

Intrinsic hand muscle – Hypothenar		<b>Abductor digiti minimi</b>
	Ulnar n. (C8, T1) – deep branch	Abducts 5 <sup>th</sup> finger
Intrinsic hand muscle – Hypothenar		<b>Flexor digiti minimi brevis</b>
	Ulnar n. (C8, T1) – deep branch	Flexes MP joint of 5 <sup>th</sup> finger
Intrinsic hand muscle – Hypothenar		<b>Opponens digiti minimi</b>
	Ulnar n. (C8, T1) – deep branch	Opposes 5 <sup>th</sup> finger (brings it into opposition with opposed thumb)

Intrinsic hand muscle		Lumbricals
	<p><u>Lumbrical 1 &amp; 2</u> Median n. (C8, T1)</p> <p><u>Lumbrical 3 &amp; 4</u> Ulnar n. (C8, T1) – deep branch</p>	<p>Flex MP joints of fingers 2-5 Assists in extension of IP joints of fingers 2-5</p>
Intrinsic hand muscle		Palmar interosseous
	<p>Ulnar n. (C8, T1) – deep branch</p>	<p>Adducts fingers 2, 4, &amp; 5 Assists lumbricals in flexing MP joints &amp; extending IP joints</p>
Intrinsic hand muscle		Dorsal interosseous
	<p>Ulnar n. (C8, T1) – deep branch</p>	<p>Abducts fingers 2-4 Assists lumbricals in flexing MP joints &amp; extending IP joints</p>